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Hierarchical zonotopal spaces.

Zonotopal algebra interweaves algebraic, geometric and combinatorial properties of a given linear map X . Of basic significance of this theory is the fact that the algebraic structure are derived from the geometry (via the least map), and that the statistics of the algebraic structures (i.e., the various Hilbert series) are combinatorial, i.e., computable using the valuation function. On the other hand, the theory is somewhat rigid since it deals with exactly three sets of ideals for each given X , their three Hilbert series and so on.

In this talk, we will show that the fundamental principles of zonotopal algebra as described in the previous paragraph extend far beyond the setup of external, central and internal ideals, by developing a whole hierarchy of zonotopal spaces. (Received September 22, 2009)